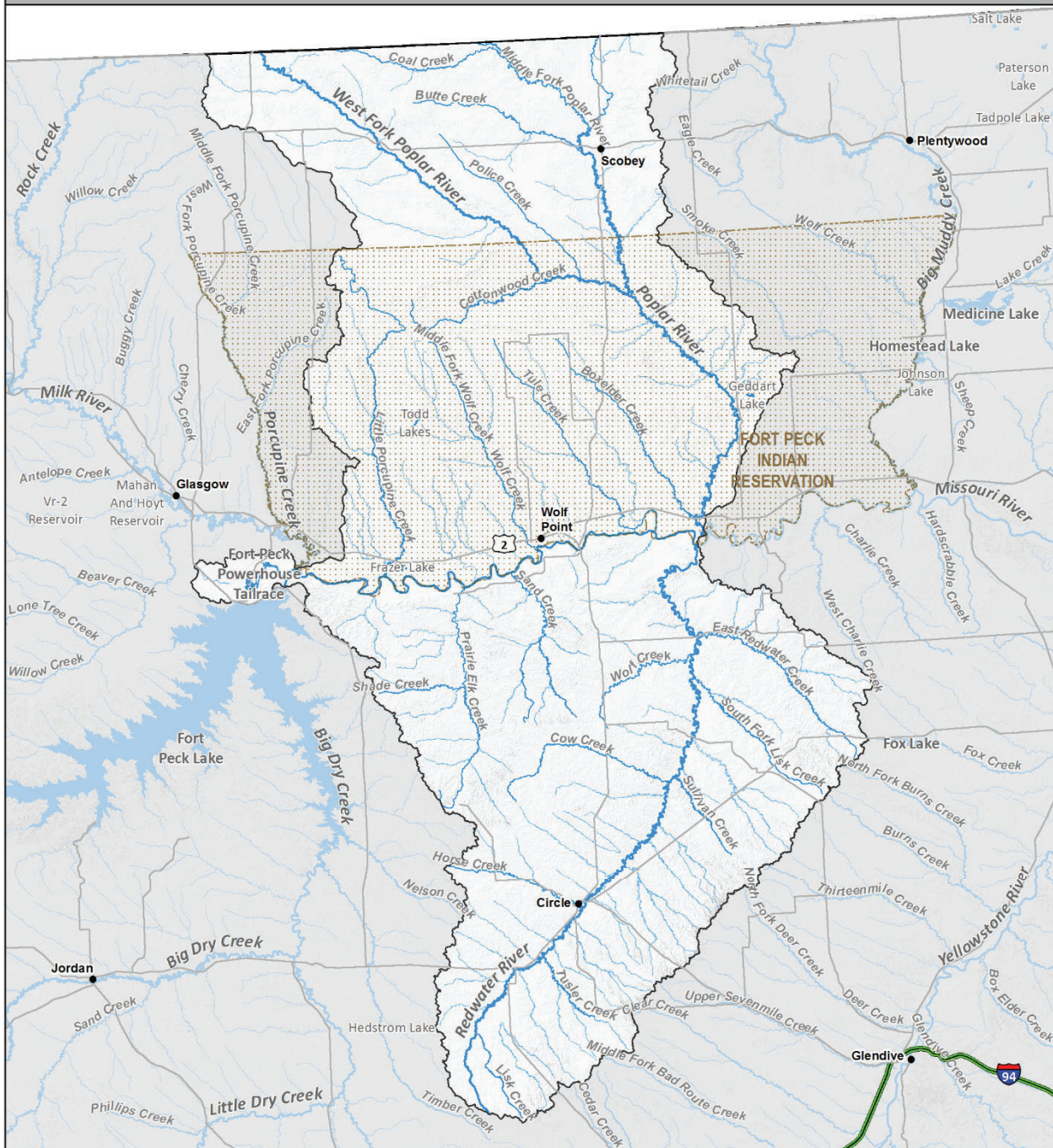




# Missouri River - Poplar Drainage

MONTANA FWP



-  Tribal Lands
-  Drainage Boundary



Area of Interest



Map Produced by:  
ASP - Geographic Data Services  
ISR 43965 - Nov 23, 2018

Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

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Miles

## **MISSOURI RIVER - POPLAR DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Missouri-Poplar drainage includes the Missouri River from Fort Peck Dam downstream to its confluence with the Poplar River, Prairie Elk Creek, Wolf Creek, Redwater River and the Poplar River. The watershed encompasses approximately 4,000 square miles located in Valley, Roosevelt, Daniels and McCone counties. The watershed includes private, state and federal lands, including the majority of the Fort Peck Indian Reservation. Agriculture dominates the lands north of the Missouri River, with wheat farming being the dominant crop. Irrigated crops such as alfalfa and corn are grown within the valleys of the major rivers and streams. South of the Missouri River is a mix of rangeland dominated by native vegetation and dryland farming.

There are no natural lakes in the drainage that contain a fishery. There are, however, numerous stock ponds and many are managed as fisheries. The Fort Peck Dredge Cuts also have a fishery and are a series of lakes connected to the Missouri River, which were created by the hydrologic dredging that occurred with the construction of Fort Peck Dam. The Missouri, Redwater and Poplar rivers contain sport fisheries that include a host of native and introduced fishes.

### **FISHERIES MANAGEMENT**

The Missouri River downstream of Fort Peck Dam holds a diverse assemblage of both native and nonnative fish species. Its proximity to the county seats of Glasgow and Wolf Point make it a popular fishery in northeastern Montana. Native fish species targeted by anglers include sauger, channel catfish, shovelnose sturgeon, burbot and paddlefish. Anglers also pursue a number of nonnative game fish species including walleye, northern pike, and rainbow trout. The Missouri River is managed as a wild fishery, with no stocking of game fish currently taking place. However, in the past, the Missouri River was stocked with a multitude of species for angling purposes. These past stocking practices in the river, along with current stocking practices in reservoirs have significantly influenced the current fish assemblage. Currently, water bodies such as Fort Peck Reservoir and smaller ponds that are at times connected to the Missouri River are stocked with nonnative species, including, walleye, Chinook salmon, northern pike, yellow perch and largemouth bass. Today, this reach of the Missouri River is home to over 50 species of fish, which consists of at least 31 native species and a minimum of 19 nonnative species.

Angling on the Missouri River occurs year-round with the spring and summer months being the most popular. Although ice fishing does occur on the Missouri River, it is limited to a few deepwater holes where good ice forms.

Since the Fort Peck Indian Reservation borders a large proportion of the north side of the Missouri River in this drainage, the Reservation and State have agreed to be consistent with harvest regulations. Anglers fishing on boundary waters (waters adjacent to the Fort Peck Reservation) are allowed one daily bag limit regardless if the angler possesses a state and tribal fishing license. Special harvest regulations are implemented for paddlefish and rainbow trout. Only one paddlefish can be harvested per year and anglers are required to have a yellow tag to fish in the Missouri River downstream of Fort Peck Dam or the Yellowstone River. An archery

season for paddlefish occurs in the Fort Peck Dredge Cuts, where anglers are allowed one fish per year and a blue tag is required.

Due to relatively low densities and limited recruitment, the daily bag limit on rainbow trout downstream of Fort Peck Dam is two fish, instead of the five that are allowed on other regional waters.

The Redwater River runs south to north through McCone and a portion of Dawson County. The Redwater River enters the Missouri River at river mile 1,682, across the river from the town of Poplar, Montana. Game fish present include channel catfish, sauger, northern pike and walleye. The Redwater River hosts 21 native and nine nonnative species. Some of the nonnative, non-game fish include western silvery minnows, plains minnows, sturgeon chubs, flathead chubs, fathead minnows, northern redbelly dace, river carpsuckers, bigmouth buffalo, smallmouth buffalo, shorthead redhorse, white sucker, goldeye and brook stickleback.

Channel catfish and northern pike are popular game fishes that anglers target in the Redwater River. During the spring and early summer, anglers fish for channel catfish and sauger in the lower portion of the Nickwall Road crossing. Nickwall crossing, which is situated approximately 1 mile upstream of the Redwater's confluence with the Missouri River precluded fish from upstream passage during most times until the spring of 2017, when FWP in combination with partners such as the Bureau of Land Management and U.S. Fish and Wildlife Service placed a fish friendly crossing at this site. Eastern District harvest regulations are in place on all portions of the Redwater River.

The Poplar River drainage is situated on the north side of the Missouri River and encompasses portions of Roosevelt, Daniels and Valley counties, as well as Saskatchewan, Canada. The East Fork meets with the Poplar River near the town of Scobey, while the West Fork enters the Poplar River just south of the Fort Peck Reservation, in Roosevelt County. A dam is located on the mainstem Poplar River just north of the Canadian border and has a great influence on the river's hydrograph. In the years before the dam, sauger and walleye were relatively abundant in the upper portions of the Poplar River. However, angler success has diminished since the construction of the Canadian dam. Current knowledge of the fishery is limited.

Several prairie ponds within the drainage are stocked with game fish to provide fishing opportunities. The deeper ponds have been stocked with game fish such as northern pike, yellow perch, white and black crappie, and largemouth bass; these are meant to be self-sustaining. Shallower ponds that have a tendency to winter kill are often stocked with hatchery-produced rainbow trout that are stocked either annually or biannually.

## **HABITAT**

The construction of Fort Peck Dam significantly altered the habitat of the Missouri River. Fort Peck Reservoir acts as both a sediment and nutrient sink for the Missouri River, and therefore delivers sediment-free and nutrient-poor water to the Missouri River downstream of the dam. The dam prevents all fish from migrating upstream. The dam has also greatly altered the natural flow regime of the Missouri River by holding back spring freshets and discharging higher than natural flows during the winter months. Channel-forming flows have been infrequent since the dam closed off the river in 1937. Fort Peck Dam provides hydroelectric power by drawing



hypolimnetic reservoir water through its penstocks into the powerhouse. This cold water (up to 50° F colder than the Missouri River above Fort Peck Reservoir) is released throughout the spring and summer months suppressing water temperatures in the Missouri River for approximately 180 river miles. Although water temperature does rise with increasing distance from the dam, average water temperatures in the lower Missouri River near its confluence with the Yellowstone River is 2° F colder than water upstream of Fort Peck Reservoir.

The altered habitat of the Missouri River due to Fort Peck Dam is evident in the presence and absence, as well as the relative abundance, of native fishes. Several species, such as sturgeon and sicklefin chubs, western silvery minnows, channel catfish and stonecats, become more abundant with distance downstream from Fort Peck Dam. Additionally, the growth rates of fish species like sauger, channel catfish and even pallid sturgeon are slower in the Missouri River near Fort Peck Dam when compared to the lower Missouri or Yellowstone Rivers. For some species like channel catfish, water temperatures may stay too cold to even meet their minimum spawning requirements.

Large irrigation and municipal intakes are located on this section of the Missouri River, both in Valley County and on the Fort Peck Reservation. Several large water intakes are located on the Missouri River: Wolf Point, south of Wiota, Frazer and Pickthorn Bay. The effect of these on fish populations of the Missouri River is unknown. In addition, numerous floating irrigation pumps are located on the river. FWP recommends fish screens for these pumps and these are mandated through the local conservation districts.

The largest habitat alteration to the Poplar River system has been the construction of a dam for a power plant located in Saskatchewan, Canada. This dam has significantly altered the natural flow regime of the Poplar River. In addition, irrigation withdrawals greatly impact the system. There are several periods throughout the year that the Poplar has little to no water flowing at its mouth.

## **FISHING ACCESS**

The majority of the fishing waters in the drainage are situated on private lands. In addition, a large proportion of the Missouri River's north banks are located on Fort Peck Reservation land. While the Missouri River has five fishing access sites throughout its 180 mile course, public access is very limited due to reservation boundaries and access site spacing. In general, access sites are more than 60 river miles apart, too far for day float trips.

The Redwater River winds through mostly private lands and access is difficult. The main access locations are at county bridge crossing right-of-ways. Similarly, the Poplar River runs through mainly private lands with the majority of access occurring at bridge crossings. A large part of the lower Poplar River is also situated on Fort Peck Reservation lands.

The Fort Peck Dredge Cuts are surrounded by U.S. Army Corps of Engineers land and have good access, including three boat launches. The majority of prairie ponds that FWP stocks within the area are on private land, but landowners allow public access through an agreement with FWP.

## SPECIAL MANAGEMENT ISSUES

The pallid sturgeon was listed as endangered in 1990 under the federal Endangered Species Act of 1973. The wild population of pallid sturgeon in the Missouri River downstream of Fort Peck Dam has had no documented natural recruitment since Garrison Dam was closed off in the 1950's. Up until 1998 the entire population was made up of old-aged fish of large sizes. Due to the lack of natural recruitment, propagation efforts commenced in 1997, with the first stocking of pallid sturgeon into the river occurring in 1998. Since that time, thousands of hatchery-reared pallid sturgeon were stocked into the river. The stocking program has been successful in staving off the extirpation of this species in the Missouri River, although habitat alterations to promote natural recruitment have been limited.

The USACE has obligations under the ESA to aid in the recovery of endangered species affected by the operation of Missouri River dams. In the 2000 Missouri River Biological Opinion and subsequent 2003 amendment to the Biological Opinion, the USFWS listed two Reasonable and Prudent Alternatives that were directed at the operations of Fort Peck Dam relative to pallid sturgeon recovery. One was a spillway test, where warm water would be spilled over Fort Peck Dam's spillway during the spring and early summer to warm the river's water temperature. The second was to examine the potential to selectively withdrawal water out of Fort Peck Dam to increase water temperatures throughout the fish's growing season. Due to a long drought in the Missouri River basin, the reservoir elevations were too low to spill and a test was never accomplished. However, due to the record setting snowfall on the eastern Montana prairie in the winter of 2010/2011 and the subsequent wet spring, Fort Peck Reservoir filled and the USACE spilled over Fort Peck Dam in 2011. Although this spill event was not designed to elicit a response of pallid sturgeon, it did. During the spring of 2011, up to 40% of the adult pallid sturgeon population moved into the Missouri River in Montana and stayed in the river throughout the spawning season. The migration began to occur when flows were just over 20,000 cfs. During early July an aggregation of adults was found in the Missouri River just downstream of the mouth of the Milk River, which is only one mile downstream of the Spillway channel. A few days later a wild larval pallid sturgeon was collected, which is the first genetically confirmed wild produced pallid sturgeon larvae ever collected in the Missouri River drainage. These results indicate that spring discharge from the Missouri River will trigger wild pallid sturgeon to use the river for spawning and that spawning can be successful.

During 2016 a large-scale larval drift experiment was conducted in the Missouri River. The experiment consisted of stocking ~700,000 less than one day old pallid sturgeon free embryos in the Missouri River just downstream from the Milk River confluence. Crews then tracked the drift dynamics of these free-flowing embryos downstream. The most important part of this experiment was the subsequent capture of a 412 mm pallid sturgeon during August of 2017. This fish was genetically tracked back to the larval drift experiment. This event further suggests that if fish are able to spawn near Fort Peck Dam there is at least enough drift distance for a portion of the larvae.

In addition, during 2018 the Missouri River had discharges in the spring through summer months of approximately 20,000 cfs. In the early spring this was due in part to higher than normal Milk River flows. Subsequently, flows in the Milk River diminished, but the Army Corps of Engineers began using the spillway at the Fort Peck Dam Project. Flows continued around 20,000 cfs for the remainder of the summer. As was observed in 2011, several adult pallid

sturgeon migrated up the Missouri River during 2018 and many stayed in the area of the spillway for an extended time period. Three known black egged females were near the Fort Peck Spillway during late June. While at least one of these females left the system before spawning, the other two stayed in the Missouri River during the early parts of July. While there was no confirmation of spawning, subsequent larval and young-of-the-year sampling will monitor if spawning and recruitment occurred.

In total, years of studying pallid sturgeon indicate that spring flows will bring adults up to the Fort Peck Dam area. Due to the 2016 larval drift experiment, we believe that if pallid sturgeon spawn in the vicinity of the Dam, at least a portion of the drift have enough distance to drift and switch to the exogenous feeding life stage. Further tests of the magnitude and timing of flows from the Fort Peck project are needed to establish a flow program that best suites the needs of both pallid sturgeon and water users.

#### *NATIVE SPECIES CONSERVATION*

Several state Species of Special Concern exist within the Poplar Drainage. Many such as pallid sturgeon, paddlefish, sauger, sicklefin chub, sturgeon chub and blue suckers are tied to the mainstem Missouri River, others such as pearl dace and northern redbelly dace are found in tributaries. While the mainstem Missouri River has had a lot of survey data collected over the past 20 plus years, relatively few surveys and/or studies have been done on tributary streams within the basin. Repeating some of the earlier survey work on these prairie systems would give managers an idea on how well their populations are persisting. Once the species are identified, specific habitat actions may be warranted to increase the likelihood of persistence.



### FISHERIES MANAGEMENT DIRECTION FOR MISSOURI RIVER - POPLAR DRAINAGE

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Fort Peck Dam to the confluence with the Poplar River	92 miles	Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Restore a self-sustaining population of pallid sturgeon in the Missouri River. Work towards modifying operations at Fort Peck Dam that are beneficial for spawning and growth.
		Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for paddlefish snagging in the Missouri River. Monitor the fishery.
		Shovelnose sturgeon (N), Sauger (N), Channel catfish (N)	Wild	General	Monitor populations to be certain that overexploitation does not occur. Maintain habitat for all life stages. Better understand how operations of Fort Peck Dam and the Missouri River's tributaries influence production, recruitment and population structure of these native game fishes.
		Rainbow trout	Wild	Restrictive Regulations	Monitor population to make sure overexploitation does not occur. Better understand how angling pressure and harvest may be impacting this species.
		Walleye	Wild	General	Allow harvest to keep population size in check to minimize hybridization with native sauger.
		Native non-game fishes (N)	Wild	General	Monitor the native non-game fishes to better understand how operations of Fort Peck Dam and tributaries influence these populations.
Fort Peck Dredge Cuts	542 acres	Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for bow fishing in the Dredge Cuts. Improve knowledge relating to the population dynamics of these fish.
Continue next page					

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
		Sauger (N), Channel catfish (N), Walleye, Northern pike, Burbot (N)	Wild	General	Maintain a quality fishery (size and catch rate) for both native and non-native game fishes. Continue to monitor these populations.
Redwater River	153 miles	Channel catfish (N), sauger (N)	Wild	General	Maintain numbers.
		Native non-game fishes (N)	Wild	Conservation	Protect habitat for native fishes. Provide fish passage at stream crossings.
Habitat needs and activities: Get functional fish passage for all species at the Nickwall Road crossing.					
Poplar River (Canadian border to mouth)	107 miles	Sauger (N), Channel catfish (N), Northern pike	Wild	General	Begin to understand fish assemblage, population size of game fishes, identify habitat problems.
Prairie Ponds	Various	Yellow perch, Largemouth bass, Northern pike	Wild	General	Continue to monitor these populations and stock fish when necessary. Look for opportunities to increase the quality of habitat by increasing the depth of reservoirs, building new reservoirs, etc.
		Rainbow trout	Hatchery	Put, Grow and Take	Continue to stock prairie ponds with put, grow and take fisheries. Evaluate angler use and evaluate which ponds should be stocked. Look for opportunities to improve habitat where applicable.





-  Tribal Lands
-  Drainage Boundary



Area of Interest



Map Produced by:  
ASP - Geographic Data Services  
ISR 43965 - Nov 23, 2018

Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

0 10 20  
Miles

## **LOWER MISSOURI RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Missouri-Big Muddy drainage encompasses approximately 3,750 square miles of land in Roosevelt, Richland, Sheridan and Daniels Counties. The main artery of the drainage is the Missouri River from the confluence of the Poplar River to the North Dakota Border, about 94 river miles. The largest tributary to the Missouri River within the drainage is Big Muddy Creek, which flows from north to south through Sheridan and Roosevelt counties and forms the eastern boundary of the Fort Peck Reservation. Agricultural lands dominate the landscape in the northern portions of the drainage, with grain being the dominant crop. To the south of the Missouri River in its furthest downstream portions, sharp breaks in vegetation occur. Throughout the river bottomlands, irrigated agriculture occurs intermixed with intact cottonwood riparian zones.

Box Elder and Whitetail Reservoirs are the two largest and most fished flatwater fisheries in the drainage and are both located in Sheridan County. Box Elder Reservoir is situated just north of the town of Plentywood, while Whitetail Reservoir is located at the town of Whitetail near the Canada border. Various other smaller prairie ponds located mainly on private land are located within the drainage.

### **FISHERIES MANAGEMENT**

The lower Missouri River, while significantly altered due to the influence of Fort Peck Dam upstream, holds a more naturalized fish assemblage than portions closer to the dam. Native game fishes such as channel catfish, sauger and shovelnose sturgeon are abundant, as are native non-game cyprinids including sicklefin and sturgeon chubs. The lower Missouri River is an important juvenile rearing area for several species of fish that spawn further upstream in the system. This is the only area of the Missouri River downstream of Fort Peck Dam where young-of-the-year sauger, shovelnose sturgeon and channel catfish are common.

Both wild and hatchery-produced pallid sturgeon are found in higher densities within this section of the Missouri River, when compared to upstream areas. After stocking, hatchery-reared juvenile pallid sturgeon tend to congregate in the lower sections of the Missouri River, most likely due to the higher abundance of forage fish and more natural temperature and suspended sediment loads. Growth rates of pallid sturgeon and other native fishes are likely higher in this section due to the increased summer water temperatures.

The Missouri River is managed as a wild fishery, with no stocking of game fish currently taking place. However, both past and current stocking practices (in Fort Peck Reservoir) have significantly influenced the current fish assemblage. In the past, upper portions of the Missouri River below Fort Peck Dam were stocked with a multitude of species in an effort to improve angling opportunities. Many of those fish have colonized the river, including the downstream portions. Today the Missouri River is home to over 50 species of fish, including at least 31 native species and a minimum of 19 introduced species. Due to the more naturalized habitat of

the lower Missouri River, introduced fishes are less abundant than in portions of the river closer to Fort Peck Dam.

Fishing regulations for the lower Missouri River are similar to that of the upper portions of the river below Fort Peck Dam with general Eastern District regulations in place for the majority of species. Special regulations are in place for the reach of the Missouri River from Fort Peck Dam to the mouth of the Milk River. These regulations are in place to protect the limited coldwater fishery that resides in this tailwater reach. Angling on the lower Missouri River occurs year-round with the spring and fall months being the most popular. Although ice fishing does occur it is limited to a few deep-water holes where good ice forms.

Big Muddy Creek hosts a wide variety of native and introduced fishes. Little fisheries data have been collected on Big Muddy Creek over the past few decades. Game fish including channel catfish, sauger and walleye are all found in the lower sections of the creek that are connected to the Missouri River. The upper portions of Big Muddy Creek are home to pearl dace, a Montana Species of Concern that is rare in Montana.

Box Elder Reservoir, also known as Bolster Dam hosts a walleye, northern pike, yellow perch and black bullhead fishery. A daily bag limit of 25 yellow perch has been implemented on Box Elder Reservoir in an effort to protect spawning fish and limit harvest. Anglers fish for walleye in the spring and summer months, while northern pike are currently the main target during the winter. Anglers harvest the occasional trophy northern pike through the ice and often use a spear to do so.

Whitetail Reservoir is a relatively shallow reservoir with maximum depths less than 15 feet. It is prone to winter kill when snow accumulates during prolonged winters. Large die offs were documented in the winter of 2010/2011. Today northern pike are very abundant in Whitetail Reservoir and some ice anglers do well on yellow perch.

Several prairie ponds within the drainage are stocked with game fishes to provide fishing opportunities. The deeper ponds have been stocked with game fish that are meant to be self-sustaining, such as northern pike, yellow perch, white or black crappie, and largemouth bass. Shallower ponds that have a tendency to winter kill are often stocked with hatchery-produced rainbow trout that are stocked either annually or biannually.

## **HABITAT**

While still highly altered due to the presence and operations of Fort Peck Dam, the section of the Missouri River in this reach is much more natural in its physical and chemical properties when compared to upstream reaches. This naturalization is largely due to tributary influence, lateral bank erosion and solar radiation. As such, the lower section of the Missouri River is appreciably warmer during the summer and carries much more suspended sediment than upstream sections. A more natural fish assemblage exists and consists of several native fish that are uncommon closer to the dam.

The lower sections of the Missouri River are the most important juvenile rearing areas for several native game fish within the Missouri River. For that reason, it is important to protect these areas by providing the oil and gas industry with up-to-date information which will assist in making informed decisions of how to minimize negative impacts to the aquatic environment.



Numerous floating irrigation pumps are located along the river. Fish screens on these pumps are recommended by FWP and mandated through the local conservation districts. Recently, applications are being processed to sell water (market water) to oil companies to be used in the process known as fracking. Fracking involves injecting 1-3.5 million gallons of pressurized water into each oil well to shatter the shale and allow the oil to flow freely. Cumulative impacts of water extraction from the Missouri River will be monitored.

Several road crossings occur along the length of Big Muddy Creek. Documenting these crossings and understanding how they may affect both fish migrations and the preclusion of northern pike is of importance. Irrigation withdrawals also impact the habitat of Big Muddy Creek, and during various periods within the year the creek has limited water.

## **FISHING ACCESS**

The north side of the Missouri River from the Milk River to the mouth of Big Muddy Creek is on the Fort Peck Reservation. Off the reservation and further downstream, limited public land exists that is adjacent to the river. FWP actively reviews possible access sites on DNRC and BLM lands. Starting in 2015 and continuing as of this writing, FWP has been actively pursuing river access at the mouth of the Redwater River south of Poplar. This property is approximately 19 river miles downstream of the Lewis and Clark Fishing Access Site and approximately 60 miles to Culbertson Bridge FAS. Additionally, FWP has approached the Fort Peck Tribes about river access at Sprole Bridge. If the Tribe was interested in developing and managing this site it would provide an access that is approximately 17.5 miles downstream of the Redwater site (42 miles to Culbertson Bridge FAS).

The majority of Big Muddy Creek flows through private land and the western banks of the lower portion are bordered by the Fort Peck Reservation. Access can be found at a few State sections and at county road crossings.

Box Elder and Whitetail Reservoirs are both readily accessible to the public. Box Elder Reservoir is owned by Sheridan County and has two concrete boat ramps. The local Walleyes Unlimited chapter placed two handicapped accessible fishing piers in the reservoir in the summer of 2012. Whitetail Reservoir is a State FAS and has a gravel boat ramp.

## **SPECIAL MANAGEMENT ISSUES**

The pallid sturgeon was listed as endangered in 1990 under the federal Endangered Species Act of 1973. The wild population of pallid sturgeon in the Missouri River downstream of Fort Peck Dam, which includes the Missouri-Big Muddy Drainage, has had no documented natural recruitment since Garrison Dam was closed off in the 1950's. Prior to 1998 the entire population was comprised of large, old fish. Due to the lack of natural recruitment, propagation efforts began in 1997, with the first stocking of pallid sturgeon into the river occurring in 1998. Since that time, thousands of hatchery reared pallid sturgeon have been stocked into the river. The stocking program has been successful in staving off the extirpation of this species in the Missouri River, although habitat alterations to promote natural recruitment have been limited.

The lower Missouri River provides essential habitat for rearing pallid sturgeon of all life stages. Data suggests that if pallid sturgeon are going to successfully recruit to the system, the lower portions of the Missouri River are critical as nursery habitat. In addition, hatchery-reared juvenile pallid sturgeon that have been stocked into the system are found in greater abundance in this section of the river than in its upstream reaches. The greater abundance of native cyprinids also makes this an important area for juvenile and adult pallid sturgeon. With a larger food supply and higher summer water temperatures, this reach provides some of the best habitat in the USFWS designated Great Plains Management Unit.

Several native Missouri River fishes including pallid and shovelnose sturgeon, paddlefish and sauger have evolved with a strategy of drifting for several days after being hatched. This life-history strategy coupled with spawning on hard surfaces such as gravel or cobble, make the lower Missouri River the most important rearing area for these fishes. Since very little hard substrate occurs in the lower portion of the river, many native fishes migrate upstream to reaches that contain the desired hard substrates to lay their eggs on. Once their eggs hatch, their larvae drift downstream where they begin freely swimming and feeding. The lower Missouri River has been identified as having the highest densities of young-of-the-year shovelnose sturgeon and sauger. In addition, the lower river is the only place where abundant young-the-year burbot have only been found, further supporting the belief that this is a critical rearing area.

Modifications to Fort Peck Dam operations (temperature and flow) are needed for the river to come closer to reaching its natural carrying capacity. Water temperatures are warmer in the downstream sections, nevertheless they are still colder during the summer months than river temperatures above Fort Peck Dam. Warmer water temperatures would increase the productivity of the system in several ways. Warmer water would likely increase macro invertebrate production, which is a key food group for numerous species of fish. Additionally, warming up the river would likely extend the fish growing season, which would positively benefit most all of the native species present. Lastly, warmer water would likely increase the survival rates of fishes, since they would spawn earlier and their progeny would go into winter at larger sizes with better condition.

Specifically, more naturalized spring flows out of Fort Peck Dam are needed in the lower Missouri River to refresh the dynamic habitat and cue migratory fish to move to spawning locations in the upper river. Very few high-water events have occurred in the Missouri River (2011 and 2018) in recent years. This lack of hydraulic heterogeneity reduces the complexity of the river and ultimately affects native fishes. In addition to creating habitat, naturalized spring flows trigger spawning migrations and spawning response of many native fishes. During both 2011 and 2018, higher than normal spring flows in the Missouri River drew a number of wild adult pallid sturgeon and hatchery origin pallid sturgeon upstream to areas near the confluence of the Milk River. A 412 mm pallid sturgeon was collected in the Lower Missouri River in North Dakota in August of 2017 by USFWS crews. This fish was genetically verified as a product of the 2016 larval drift study conducted by USGS and FWP. The collection of this fish indicates that pallid sturgeon spawning in the Missouri River below the mouth of the Milk River provides adequate drift distance for free-embryos to survive before becoming exogenously feeding larvae (conditioned on managed flows from Fort Peck Dam).



### *NATIVE SPECIES CONSERVATION*

Several state Species of Special Concern exist within the Lower Missouri River Drainage. Many species such as pallid sturgeon, paddlefish, sauger and blue suckers are tied to the Missouri River, others such as pearl dace are found in tributaries. While the mainstem Missouri River has had a lot of survey data collected over the past 20 plus years, relatively few surveys and/or studies have been done on tributary streams like the Big Muddy Creek system.

Pearl dace are known to occur at localized sites at relatively low densities within the Big Muddy watershed. Both Montana State University and the Montana Heritage Program conducted surveys of native fishes within the Big Muddy drainage in the early and middle 2000's. Both research entities found a negative relationship between the presence of the nonnative northern pike and native species richness. In particular, pearl dace were only found in a few localized areas above barriers from the mainstem Big Muddy.

More recently, pearl dace were sampled within Plentywood Creek, in the northeast corner of Montana. Further sampling in Plentywood Creek is needed to better understand distribution and densities of this species. In conjunction with fish sampling, a broad assessment of the habitat within Plentywood Creek may lend insight the current threats on pearl dace within this system.

To conserve native fishes and especially pearl dace, more surveys need be done within the Big Muddy drainage, with particular focus on existing barriers and northern pike distribution.

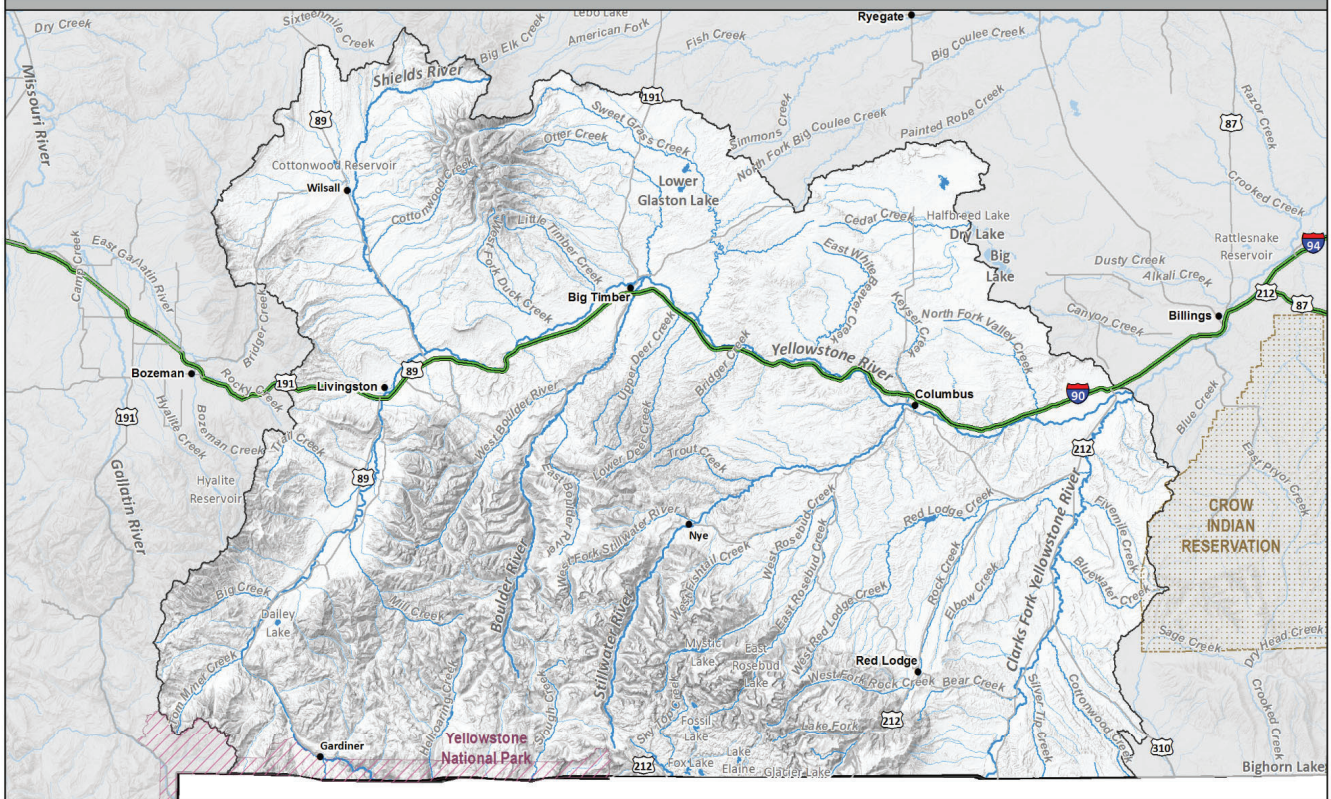
### FISHERIES MANAGEMENT DIRECTION FOR LOWER MISSOURI RIVER DRAINAGE

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Confluence of Poplar River to North Dakota border	94 miles	Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Restore a self-sustaining population of pallid sturgeon in the Missouri River. Work towards modifying operations at Fort Peck Dam that are beneficial for spawning and growth.
		Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for paddlefish snagging in the Missouri River. Monitor the fishery.
		Shovelnose sturgeon (N), Sauger (N), Channel catfish (N)	Wild	General	Monitor populations to be certain that overexploitation does not occur. Maintain habitat for all life stages. Better understand how operations of Fort Peck Dam and the Missouri River's tributaries influence production, recruitment and population structure of these native game fishes.
		Walleye	Wild	General	Allow harvest to keep population size at levels which will minimize hybridization with native sauger.
		Native non-game fishes (N)	Wild	Conservation	Monitor the native non-game fishes to better understand how operations of Fort Peck Dam and tributaries influence these populations.
Big Muddy Creek (Canadian border to mouth)	194 miles	Channel catfish (N), Sauger (N)	Wild	General	Maintain numbers. Inventory habitat issues, such as fish passage barriers and unscreened diversions.
		Native non-game fishes (N)	Wild	Conservation	Protect habitat for native fishes. Provide fish passage at stream crossings.

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Box Elder Reservoir	77 acres	Yellow perch, Walleye, Northern pike	Wild/ Transfer	General/ Restrictive Regulations	Continue to monitor these populations. Evaluate the yellow perch transfers and the discontinued walleye stocking. Limit harvest of yellow perch until the fishery rebounds.
Whitetail Reservoir	25 acres	Yellow perch, Northern pike	Wild	General	Continue to monitor populations. Stock fish after winter kills. Evaluate balance between yellow perch and northern pike.
Prairie Ponds	Various	Yellow perch, Largemouth bass, Northern pike	Wild	General	Continue to monitor these populations and stock fish when necessary. Look for opportunities to increase the quality of habitat by increasing the depth of reservoirs, building new reservoirs, etc.
		Rainbow trout	Hatchery	Put, Grow and Take	Continue to stock prairie ponds with put, grow and take fisheries. Evaluate angler use and evaluate which ponds should be stocked. Look for opportunities to improve habitat where applicable.

# Upper Yellowstone River Drainage

MONTANA FWP



- National Park Service
- Tribal Lands
- Drainage Boundary



Map Produced by:  
ASP - Geographic Data Services  
ISR 43965 - Nov 23, 2018

Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

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Miles

## **UPPER YELLOWSTONE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Upper Yellowstone River flows for more than 180 miles from the Montana/Wyoming border to the confluence of the Clarks Fork of the Yellowstone, through Park, Sweet Grass, Stillwater and Yellowstone counties. This section of river, referred to here as the Upper Yellowstone Drainage, supports a quality coldwater fishery in relatively unaltered habitat. The Upper Yellowstone is free flowing, with no dams or river-wide diversion structures present. Most of the river flows through range and crop land traditionally managed for agriculture but faced with increasing pressure from residential development. Towns and cities along this reach of the Yellowstone include Gardiner, Livingston, Big Timber, Columbus, and Laurel. Significant recreational river use also comes from the population centers of Bozeman and Billings.

Several large tributaries flow into the Upper Yellowstone River, including the Shields, Boulder, Stillwater and Clarks Fork. Numerous smaller, coldwater tributaries flow into the river upstream from Livingston, while a mix of coldwater streams draining from nearby mountains (Bridgers, Bangtails, Gallatins, Crazies, Absarokas, and Beartooths), and warmer water prairie streams enter the Yellowstone between Livingston and Laurel. In total, there are approximately 3,200 miles of fish-bearing stream occurring within 433 streams within the drainage. Additionally, there are 524 lakes, totaling 10,516 surface acres.

### **FISHERIES MANAGEMENT**

The upper Yellowstone River drainage supports a very popular, high quality trout fishery throughout its length. In addition to the fishery of the mainstem Yellowstone, many of the tributaries provide high quality trout fisheries. Above Livingston, the Upper Yellowstone provides a popular sport fishery for rainbow trout, brown trout and Yellowstone cutthroat trout. The tributaries support Yellowstone cutthroat, rainbow, brown and brook trout fisheries as well. Downstream from Livingston, the mainstem and tributaries of the Yellowstone support high quality fisheries for brown and rainbow trout, but Yellowstone cutthroat trout numbers decline moving downstream, and only the occasional cutthroat is caught below Big Timber. Other fish species in the Upper Yellowstone include mountain whitefish and several species of nongame fish, both native and nonnative.

Angling in the Upper Yellowstone River and all tributaries is open all year but is limited by cold weather and ice in winter and high stream flows and associated turbidity during runoff.

All flowing waters in this drainage that support self-sustaining trout populations are managed as wild trout fisheries, emphasizing habitat protection and natural reproduction. Tributary streams and their connectivity with the Yellowstone are critical for reproduction, as many of the tributaries contain much higher quality spawning habitat than does the Yellowstone River. This connectivity is particularly important for Yellowstone cutthroat trout because their spawning use in the main stem of the river is limited. Fishing regulations are tailored to protect trout fisheries and satisfy angler demand.



Several lowland lakes and reservoirs, and hundreds of high mountain lakes are part of the Upper Yellowstone Drainage. Two of the lowland lakes, Cooney Reservoir and Dailey Lake, are managed for balanced walleye/trout fisheries via stocking, fishing regulations and other strategies. Dailey Lake is managed for a perch fishery as well. The high mountain lakes are managed to provide maximum angler benefit while minimizing impacts to forest lands and Wilderness, promoting native Yellowstone cutthroat trout restoration, and creating opportunities to catch rare and unique fish species. Fish species in the mountain lakes include Yellowstone cutthroat, rainbow, brook and golden trout, as well as Arctic grayling. Yellowstone cutthroat trout, golden trout and Arctic grayling are stocked in selected mountain lakes on a regular basis. LeHardy strain Yellowstone cutthroat trout from Wyoming are the brood source for stocked Yellowstone cutthroat trout and Sylvan Lake is the brood source for golden trout that are stocked throughout the state. An important objective of mountain lakes management is to avoid conflicting or compromising fisheries management in streams downstream of the lakes in the same drainage.

Restoration of native Yellowstone cutthroat trout has been a priority in the Upper Yellowstone Drainage. The species has been severely diminished in population size and distribution during human development and is limited to the upper end of the Yellowstone River and tributaries (above Springdale), and the headwaters of tributaries to the Yellowstone downstream from Springdale. Strategies to protect and restore Yellowstone cutthroat trout populations include maintaining connectivity with spawning tributaries and limiting angler harvest in the upper end of the drainage, and isolating the species using passage barriers to protect it from nonnative trout in tributaries to the lower end of this reach. Several projects in recent years have included building fish passage barriers, chemically removing nonnative trout from above the barriers, and reintroducing cutthroat trout in these streams. These strategies have been successful for recovering several cutthroat trout populations. These new populations have been managed as sport fish: all cutthroat trout in tributaries to the Yellowstone downstream from Pine Creek Bridge are part of an angler's daily trout limit. This regulation strategy has helped build public support for cutthroat trout restoration projects. The long-term goal for cutthroat conservation in the Upper Yellowstone (above Springdale) is to have 20% of the historically occupied habitat restored to Yellowstone cutthroat trout. In the Shields River, upstream from Chadbourn Diversion, the long-term goal for Yellowstone cutthroat trout<sup>1</sup> conservation is to have 100% of the historically occupied habitat restored with secure conservation populations of Yellowstone cutthroat trout.

## **HABITAT**

Although it is the longest undammed river in the contiguous United States and much of the river remains unaltered, significant habitat changes have impacted the Upper Yellowstone River since human settlement. Notable historic development along the Yellowstone River corridor includes the construction of a major railroad, as well as numerous roads to accommodate vehicle travel, including county roads, state highways and more recently a federal interstate highway. All of these developments have, in some way, impacted the river's ability to migrate laterally and interact with its historic floodplain. Using angular rock or concrete rip rap to protect roads, bridges, homes, and farmland or ranchland has restricted the natural expression of the river, and

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<sup>1</sup> As described in the Yellowstone Cutthroat Trout Conservation Strategy for the Shields River Watershed above Chadbourne Diversion.

possibly the quality of fish habitat in the river. Significant development is ongoing and may accelerate along the Yellowstone, particularly in the form of residential housing, which may further impact habitat.

An adequate quantity of cool, oxygenated water is necessary for survival and growth of trout in the upper Yellowstone River. The Yellowstone, Shields, Stillwater and Boulder rivers are all considered priority waters under FWP's drought policy and face potential fishing closures during severe drought conditions that can occur in late summer. In addition to these waters, Rock Creek and the Clarks Fork of the Yellowstone are both severely dewatered from irrigation in specific areas on certain years. Trout populations in these waters can be expected to fluctuate over the years in response to water availability. Other small tributaries in the drainage can also be impacted by irrigation withdrawals.

FWP currently holds water leases on Big, Cedar, Mulherin, and Locke Creek. These water leases are used to maintain instream flow that ensures the survival of Yellowstone cutthroat trout redds and the recruitment of fry to the Yellowstone River.

The operation of irrigation diversions and ditches in the Upper Yellowstone Drainage leads to the entrainment of hundreds of thousands, if not millions of fish each year. Many of these fish are returned or are able to swim back to the stream when ditches are shut down, but many others become stranded and die. Fish screens are uncommon in the area due to their high cost and need for maintenance, troubles with functionality, and overall lack of acceptance by the ranching community. Other alternatives to fish screens are being explored.

Numerous irrigation diversions in the Clarks Fork of the Yellowstone serve as barriers to upstream passage of certain fish species, particularly burbot. Lack of fish passage and low water appear to have impacted the burbot population in the Clarks Fork.

Overall, water quality is good in the upper Yellowstone. Whirling disease has been confirmed in rainbow and Yellowstone cutthroat trout in the middle portion of the drainage, but has not been found in the lower end, despite intensive testing.

## **FISHING ACCESS**

Almost 30 FASs are located on the Yellowstone River between Gardiner and Laurel. The majority of these sites are concentrated on the upper end of the river, where angler use is highest. There are also several additional sites available to the public that are not under FWP ownership or management. The area of the upper Yellowstone most lacking in fishing access is the reach between Columbus and Park City, approximately 20 river miles long. This reach has been a top priority for future access sites.

The Stillwater River has nine fishing access sites and supports very high recreational use, including commercial rafting operations, numerous angling and recreational floaters, bank angling, and camping. Only two FASs exist on the Boulder River, despite the river boasting a very high-quality fishery. Much of the upper Boulder River flows through Forest Service land where there are a number of developed campgrounds and good public access. Four access sites

are located on Rock Creek, but these are all grouped in a small area between Red Lodge and Roberts. Only one walk-in fishing access site exists on the Shields River.

East Rosebud Creek, West Rosebud Creek, Big Timber Creek, Sweet Grass Creek and other smaller streams have desirable fisheries, but public access is primarily limited to county road crossings and a small number of public sites. Stream access via private land is becoming more difficult and therefore it will be critical to secure public access in these areas.

### **SPECIAL MANAGEMENT ISSUES**

Though angling use appears to be stable over the past decade or so, there has been a marked increase in the use of jet boats and rafts on the Yellowstone, and rafts on the Stillwater. In addition, angling pressure on the Yellowstone appears to be shifting downstream, with anglers from Bozeman and Livingston travelling greater distances to avoid crowds. Some concern has been raised over outfitters and guides who are not locally based beginning to operate farther downstream on the Yellowstone, Boulder, and Stillwater rivers. Though overall use in the lower end of this reach of the Yellowstone drainage is relatively low, the apparent upward trend could become a management issue in the future.

### FISHERIES MANAGEMENT DIRECTION FOR THE UPPER YELLOWSTONE RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River (YNP to Pine Creek Bridge)	97 miles	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support quality and sustained angling opportunity. Maintain present numbers and sizes. Consider increasing angler harvest to reduce numbers if necessary to maintain fish growth.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery to maintain the current population.
		Mountain whitefish (N)	Wild	General	Maintain current populations.
Habitat needs and activities: Maintain current habitat					
Shields River and Tributaries (Upstream of Chadbourne Diversion)	54 miles in mainstem	Rainbow trout	Wild	Suppression	Remove where possible to prevent hybridization with Yellowstone cutthroat trout.
		Brown trout	Wild	General	Determine level of threat of brown trout to Yellowstone cutthroat trout. If needed reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted.
		Yellowstone cutthroat trout (N)	Wild	Conservation	Maintain catch and release fishery to maintain current populations. Implement project to protect and/or expand current populations.
		Mountain whitefish (N)	Wild	General	Maintain current populations.
		Brook trout	Wild	Suppression	Remove where possible to protect Yellowstone cutthroat trout.
Habitat needs and activities: Work to improve stream flow and water temperatures. Work slated to begin during the fall of 2012 to repair the Chadbourne Diversion and ensure that it is a fish barrier. Selective fish passage options are being pursued but are dependent on negotiations with neighboring landowner.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Shields River and Tributaries (Downstream of Chadbourne Diversion)	11 miles in mainstem	Rainbow trout, Brown trout	Wild	General	Manage harvest to support quality and sustained angling opportunity. Maintain present numbers and sizes. Consider increasing angler harvest to reduce numbers if necessary to maintain fish growth.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery to maintain the current population.
		Mountain whitefish(N)	Wild	General	Maintain current populations.
Habitat needs and activities: Work to improve stream flow and water temperatures.					
Yellowstone River Tributaries (YNP to Pine Creek Bridge)	1,058 miles	Rainbow trout, Brown trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery to maintain the current populations.
		Mountain whitefish(N)	Wild	General	Maintain current populations.
		Brook trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
Habitat needs and activities: Improve habitat (riparian, in-stream, and connectivity) and ensure stream flow in dewatered systems.					
Dailey Lake	206 acres	Yellowstone cutthroat trout (N) Rainbow trout	Hatchery/ Wild	Put, Grow and Take	Monitor recruitment to spring gill nets and adjust stocking as necessary to maintain size and age classes.
		Yellow perch	Wild	General	Monitor size and recruitment to spring gill nets.
Continue next page					



Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Walleye	Hatchery/ Wild	Put, Grow and Take	Monitor recruitment to spring gill nets and adjust stocking as necessary to maintain size and age classes.
Habitat needs and activities: Work to maintain adequate lake elevations and balance trout and warm water fisheries through stocking plans.					
Yellowstone River (Springdale to Clarks Fork)	95 miles	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support quality angling opportunity.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery to maintain the current population.
		Mountain Whitefish(N)	Wild	General	Maintain numbers. Attempt to better monitor population abundance, trends and angler harvest.
		Burbot (N)	Wild	General	Maintain numbers. Learn more about population abundance, distribution and habitat use. Attempt to enhance population and manage for limited harvest.
Habitat needs and activities: Improve habitat to support ecosystem function and fish production.					
Boulder River and Tributaries	65 miles in mainstem and 168 miles in tributaries	Rainbow trout	Wild	Restrictive Regulations	Downstream from Hawley Creek: manage harvest to support high quality angling opportunity. Upstream from Hawley Creek: reduce numbers to benefit Yellowstone cutthroat trout.
		Brown trout	Wild	Restrictive Regulations	Manage harvest to support high quality angling opportunity.
Continue next page					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of Combined Trout limit for this drainage. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new populations where opportunities exist. Manage for large, interconnected genetically pure population upstream of waterfall barrier near Hawley Creek.
		Mountain Whitefish(N)	Wild	General	Maintain numbers.
		Brook trout	Wild	Liberal Regulations/Suppression	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning habitat.					
Stillwater River and Tributaries	70 miles in mainstem and 451 miles in tributaries	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support high quality angling opportunity. Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted.
		Yellowstone cutthroat trout (N)	Wild	Liberal Regulations/Conservation	Allow harvest as part of Combined Trout limit for this drainage. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new populations where opportunities exist.
		Mountain Whitefish (N)	Wild	General	Maintain numbers.
Continue next page					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Brook trout	Wild	General/Suppression	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning habitat.					
Clarks Fork and Tributaries (except Rock Creek)	141 miles in mainstem and 229 miles in tributaries	Rainbow trout, Brown trout	Wild	Wild	Manage harvest to support quality angling opportunity.
		Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of District-wide Combined trout limit. Consider establishing new populations where opportunities exist.
		Mountain Whitefish(N)	Wild	General	Maintain numbers. Attempt to better monitor population abundance, trends and angler harvest.
		Brook trout	Wild	General	Manage for sport fishery with opportunity for high level of harvest.
		Burbot(N)	Wild	General	Maintain numbers. Learn more about population abundance, distribution and habitat use.
		Arctic grayling	Wild	General	Maintain numbers. Search for evidence of self-sustaining population in upper tributary reaches.
Habitat needs and activities: Improve fish passage over irrigation diversion dams. Minimize dewatering of lower reaches during drought years. Improve burbot habitat.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Rock Creek and Tributaries	59 miles in mainstem and 274 miles in tributaries	Rainbow trout, Brown trout	Wild	Wild	Manage harvest to support high quality angling opportunity. Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted
		Yellowstone cutthroat trout (N)	Wild	Conservation	Allow harvest as part of District-wide Combined Trout limit. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Indigenous populations should take top priority. Consider establishing new populations where opportunities exist.
		Brook trout	Wild	General/Suppression	Reduce numbers where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning and rearing habitat. Minimize large scale human-caused stream channel alterations. Minimize dewatering of certain stream reaches during drought years.					
Cooney Reservoir	733 acres	Rainbow trout	Hatchery	Put, Grow and Take	Evaluate stocking and harvest regulations to optimize number stocked, size of fish and angler catch rate throughout the year.
		Walleye	Wild/Hatchery	Put, Grow and Take	Continue monitoring to ensure adequate natural reproduction to support fishery. Stock if natural reproduction is inadequate. Maintain balance between walleye numbers and forage base.
		Burbot (N)	Wild	General	Consider adjusting harvest regulations to improve fishery. Manage harvest to support quality angling opportunity and maintain forage base. Continue monitoring population as it continues to become established.
Continue next page					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Brown trout	Wild	Wild/General	Maintain numbers.
		Yellow perch, Black crappie	Wild	Wild/ General	Maintain numbers. Continue monitoring. Consider habitat improvement projects if increase in numbers is deemed beneficial.
Habitat needs and activities: Explore adding shoreline/shallow water habitat structures to improve survival of forage fish, sport fish and crayfish.					
Yellowstone River Tributaries (Springdale to Clarks Fork) Except Stillwater, Boulder, Clarks Fork	540 miles	Rainbow trout, Brown trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
		Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of District-wide Combined Trout limit. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new populations where opportunities exist.
		Mountain Whitefish(N)	Wild	General	Maintain numbers.
		Brook trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Improve habitat to support ecosystem function and fish production.					

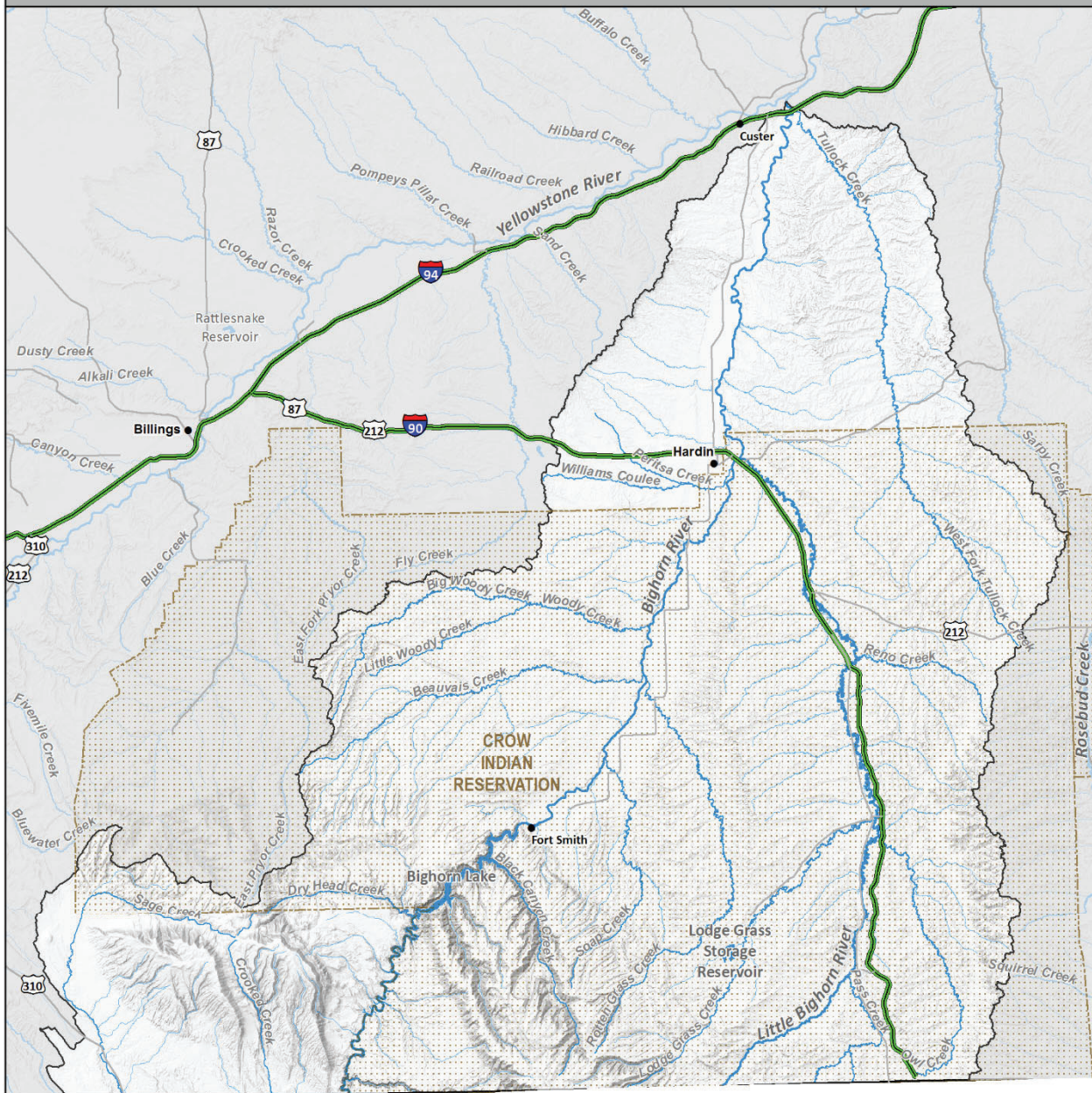




Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Beartooth/Crazy Mountain Lakes	687 lakes and 9,318 acres	Yellowstone cutthroat trout (N)	Hatchery/Wild	Put, Grow and Take	Maintain numbers. Monitor self-sustaining lakes to ensure population persistence. Continue stocking lakes currently stocked and managed for quality fish size quality. Adjust stocking rates as needed. Consider stocking in lakes containing rainbow and/or golden trout where genetic swamping would be consistent with Yellowstone cutthroat trout populations downstream in the drainage.
		Brook trout	Wild	General	Maintain numbers in most lakes. Reduce densities in lakes where it will benefit individual fish growth. Reduce numbers where Yellowstone cutthroat trout populations are potentially threatened.
		Rainbow trout	Wild	General	Reduce numbers and genetic contribution in drainages where Yellowstone cutthroat trout restoration is a priority.
		Golden trout	Hatchery/Wild	Put, Grow and Take	Maintain numbers in most lakes through stocking and natural reproduction. Reduce numbers in areas where priority Yellowstone cutthroat trout populations are potentially threatened.
		Arctic grayling	Hatchery/Wild	Put, Grow and Take	Maintain numbers. Explore opportunities to provide angling opportunities in more lakes. Consider planting in lakes that contain other fish species to provide multi-species angling opportunity.
Habitat needs and activities: Explore adding spawning gravel to lakes where natural reproduction is desired.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
All waters	3,200 miles of stream	Nongame species (native and nonnative)	Wild	Conservation	Maintain connected populations, support ecosystem function.

# Bighorn River Drainage

MONTANA FWP



-  Tribal Lands
-  Drainage Boundary



Area of Interest



Map Produced by:  
ASP - Geographic Data Services  
ISR 43965 - Nov 23, 2018

Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

0 10 20  
Miles

## **BIGHORN RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The water source for the Bighorn River (and its major tributary the Little Bighorn River) begins in Wyoming in the Wind, Shoshone, and Bighorn mountain ranges before entering Montana, where it also receives water draining from the Bighorn Mountains as well as the Pryor Mountains. The Montana portion of the drainage includes a portion of the Shoshone River drainage which drains the south face of the Pryor Mountains (primarily the Sage Creek watershed) and flows into Wyoming, but in turn enters Bighorn Lake in Wyoming. Land ownership in this drainage includes private, Custer National Forest, the Crow Tribe Reservation, BLM, and State of Montana land.

Yellowtail Dam impounds the Bighorn River to form Bighorn Lake, which is the largest body of water in the watershed. This reservoir supports a popular recreational fishery that includes a diverse assemblage of native and nonnative species. Tributaries to the Bighorn River in Montana above the dam include Dry Head, Hoodoo, Pitchfork, Spring, Black Canyon, Big Bull Elk, Little Bull Elk, Porcupine, and Crooked creeks.

The lower Bighorn River begins at Yellowtail Dam and enters the Yellowstone River 86 miles downstream. Tributary streams of the lower Bighorn River include the Little Bighorn River, Rotten Grass Creek, Soap Creek and War Man Creek. Currently, the Bighorn Canal captures the entire flow of War Man Creek within about one mile of its confluence with the river. Lime Kiln Creek is a small stream that enters the Bighorn River just below Yellowtail Dam. Grapevine Creek is an 8-mile long tributary of the Bighorn River that joins the river downstream of Yellowtail Dam.

### **FISHERIES MANAGEMENT**

The Crow Reservation covers a large portion of this drainage. Within the Reservation boundary, the State of Montana has the authority to manage Bighorn Reservoir, Afterbay Dam, and the Bighorn River proper. The Crow Tribe is responsible for management of all other waters within the reservation boundary. Management of tribal waters is not described in this document, except to reference a Memorandum of Understanding that the Crow tribe, several federal agencies and FWP signed, agreeing to work together to restore Yellowstone cutthroat trout populations in the Bighorn and Pryor mountain ranges.

Completion of Yellowtail Dam altered the fisheries potential of the Bighorn River. Historically, this river supported a warmwater assemblage of riverine species. The hypolimnetic release of cold, clear, nutrient-rich water now supports a world-class tailwater fishery for rainbow and brown trout. The Bighorn River rainbow and brown trout fishery is found from Fort Smith to Hardin. The Bighorn River fishery downstream of Hardin transitions into smallmouth bass, walleye, sauger, burbot, and channel catfish fishing. Bighorn Reservoir, created by Yellowtail Dam, provides substantial fishing opportunity for smallmouth bass, walleye, sauger, perch, crappie, brown trout, rainbow trout, and burbot. Mountain streams in the Bighorn and Pryor mountains provide fishing opportunity for cutthroat trout, rainbow trout, brown trout and brook



trout. Smaller streams in this reach under FWP management are essentially warm water prairie streams that provide habitat for native minnow communities.

Walleye and sauger management changes are being experimentally implemented in Bighorn Reservoir because of a genetically unique population of sauger in the reservoir which is reliant on wild spawning in the Wyoming portion of the Bighorn River. In an effort to reduce potential hybridization rates between these sauger and walleye, and to demonstrate continued commitment to sauger preservation and restoration, FWP initiated stocking sterile walleye (with greater than 90% triploidy) into the reservoir in 2009. Additionally, sauger are being spawned in Wyoming and reared at Miles City State Fish Hatchery to be stocked in the lower portion of Bighorn Reservoir in an attempt to increase abundance of sauger and improve angler catch rates and satisfaction.

Crooked Creek and Piney Creek contain the last aboriginal Yellowstone cutthroat trout in areas managed by FWP in the Pryor Mountains. A few populations of cutthroat can also be found in the Pryor and Bighorn Mountains within the Crow Reservation. A memorandum of understanding is in place with the Crow Tribe, BLM, USFS, USFWS, and FWP to recover cutthroat and to assist each other when possible for restoration projects. The MOU is expiring and will need to be reviewed and signed in 2019. Sage Creek was a recent cooperative interagency project where brook trout and rainbow trout were removed and replaced with Yellowstone cutthroat trout. Currently the agencies and the Crow Tribe are in the process of confirming that this project was completed successfully. This fishery is now managed as a recreational cutthroat fishery with harvest allowed. In 2008, a brook trout removal and fish barrier project was completed in Crooked Creek. The fishery continues a natural slow downstream expansion. Habitat improvements at Piney Creek in 2010 has improved the fishery which occupies a small reach of stream.

The Bighorn River drainage falls under the Central District fishing regulations. Bighorn Reservoir regulations are developed cooperatively between FWP and the Wyoming Game and Fish Department. This cooperation helps to keep the regulations similar in both states for the same water body. Regulations differ from the Central District standards for bass, shovelnose sturgeon, sauger, walleye, catfish, and ling in Bighorn Reservoir. The Bighorn River regulations have specific sauger regulations that differ from the standard regulation. Other regulation exceptions include Crooked Creek and Piney Creek, which allow catch and release for cutthroat trout only. Cutthroat in Crooked Creek and Piney Creek are aboriginal, and efforts have been made to maintain and improve these conservation populations of cutthroat. In Sage Creek harvest of five Yellowstone cutthroat trout is allowed.

Angling pressure from 2009 through 2015 was estimated between 149,885 to 202,122 angler days for all three sections of the Bighorn River. On average the upper 13 miles accounts for 70% of the fishing pressure of which an average 78% is by out-of-state anglers. In the 2015 mail in Angler Survey section 3 the upper 13 mile section of the Bighorn River was ranked #3 most utilized waterbody in Montana and ranked #1 in FWP Region 5.

## **HABITAT**

The Bighorn River has been the center of water management disputes between Wyoming and Montana stakeholders for nearly a decade. Criteria for water releases from the dam were



developed to support the trout fishery downstream in the Bighorn River, and recommendations for reservoir elevations were advocated by the National Park Service and the State of Wyoming. New operating criteria were developed using computer models to improve transparency of water management by the BOR and to better understand hydrologic limitations imposed by varying water supply, reservoir storage, and dam discharge. Operational rules set reservoir drawdown and refill targets based on the shape and volume of inflows, and scheduled dam discharges to balance the often conflicting requirements for fish and recreation in the reservoir and river downstream. Rule curves were designed to reduce reservoir drawdown and improve refill and optimize river flows (reduce duration of low flows and duration and magnitude of high flows) to benefit the fisheries in the Bighorn River downstream of the dam. It is not possible to prevent all extreme high or low water conditions in either the river or reservoir because of forecasting error and natural variability in annual water supply from snow melt and unpredictable rainfall events.

After several years of highwater events members of the public, the Bighorn Alliance, and FWP have requested a review of the Rule Curves to ensure they address management of above average inflow years as well as below average inflow years. Currently, the BOR is utilizing a work group to review and make recommendations for future management.

Side channel habitat in the Bighorn River has been declining since the dam was put in place in 1967 due to lack of high spring flows and sedimentation. A study by the BOR determined the river bed was not substantially degrading, and the side channels were essentially being plugged with sediment at the heads of the channels with subsequent invasive vegetation growth holding the sediment in place. Some channel heads have been identified for excavation with one completed in 2012. It is anticipated a follow up study will be conducted in 2019 to measure changes during the past eight years of above average discharge. Recommendations for other side channel restoration projects may be an outcome of this study.

The Bighorn River Alliance has developed a Research Initiative to better understand the river's biology, hydrology, water quality, and channel geomorphology and the interconnections. FWP intends to participate with implementation when prudent and possible.

Several habitat projects have been completed recently in tributary systems. A fish barrier to prevent brown trout from occupying Yellowstone cutthroat habitat and range was put in place in Crooked Creek in 2008. A small private irrigation reservoir on Piney Creek was improved by restoring volume and altering water withdrawal from an open pipe to a kettle system, which reduced fish loss to irrigation as well as improved pool habitat. Additionally, the BLM placed logs in Piney Creek to improve substrate and cover habitat. Efforts have been made to ensure culverts and other bank projects in Sage Creek are sized and placed properly to maintain fish passage in the upper watershed. An extensive culvert and road maintenance project by the Custer Forest reduced erosion and sediment transport into Crooked Creek.

## **FISHING ACCESS**

FWP manages seven Fishing Access Sites along the Bighorn River: Manuel Lisa, General Custer, Grant Marsh, Arapooish, Two Leggins, Mallards Landing, and Bighorn. Because of the popularity of the Bighorn River, additional FASs could improve access and reduce crowding. Two areas of particular interest would be to develop an additional access between Three Mile and Bighorn FASs, and to develop an access near the St. Xavier Bridge. Grant Marsh FAS has

had significant erosion that has twice washed out the access road requiring road rebuilding and latrine relocation. Currently the site is closed to vehicles as the road was severely washed out in 2017 with additional erosion in 2018. Bighorn access boat ramps are challenging to boaters to use when flows exceed 8,000 cfs. A small area was cleared upstream of the upper ramp to provide an area of no flow to help with congestion on the ramp and a place to remove drift boats. Alternatives to improve the use of this ramp at high water need to be considered and addressed in the future.

The Bighorn Canyon National Recreation Area managed by the National Park Service manages access for the river at Three Mile (Lind Access) and Afterbay Dam. Additionally, the Park Service manages two boat ramps on Bighorn Reservoir at Ok-a-beh, and Barry's Landing in Montana as well as one boat ramp on the Afterbay Reservoir. Access is also available in Wyoming for Bighorn Reservoir at Horseshoe Bend. Several more remote access locations managed by the Forest Service and the BLM allow for access on many streams in this management area. Lodge Grass Reservoir provides opportunity for tribal and non-tribal members and is managed by the Crow Tribe.

### **SPECIAL MANAGEMENT ISSUES**

Fishing contests occur on Bighorn Reservoir for bass, walleye, and carp. The Bighorn River supports on an annual basis, an extensive outfitting and guiding industry. The upper 13 miles on the Bighorn River is restricted to non-motorized boats to reduce conflicts between drift boaters and floaters and powered water craft. Additional FAS sites between Three Mile and Two Leggins FAS would provide additional options for anglers and floaters to choose to reduce crowding. Several streams in this management area support conservation populations of Yellowstone cutthroat trout.

### FISHERIES MANAGEMENT DIRECTION FOR THE BIGHORN PRYOR RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Bighorn Reservoir (Yellowtail Reservoir)	17,300 acres	Sauger (N)	Wild, Hatchery	Put, Grow and Take/ Conservation/General	Supplemental stocking on experimental basis 2013-2016 in lower reservoir as an effort to improve catch and harvest rates for anglers. Monitor population over time; coordinate with Wyoming Game and Fish for regulation. Support Wyoming Game and Fish habitat actions in the river to maintain and improve this fishery.
		Walleye	Wild, Hatchery	Put, Grow and Take/ Quality	Stock only 90%+ triploid fingerling in effort to reduce potential risk for hybridization with unique and pure sauger in the Upper Bighorn River. Provide opportunity to catch walleye with trophy opportunity.
		Smallmouth bass, Yellow perch, Crappie, Brown trout, Channel catfish (N), Burbot (N), Carp	Wild	General	Monitor populations over time; rely solely on natural reproduction.
		Rainbow trout	Hatchery	Put, Grow and Take	Monitor populations as necessary.
		Native suckers & minnows (N)	Wild	General	Monitor populations as necessary.
Habitat needs and activities: Make recommendations to BOR for lake elevation management, evaluate sauger and walleye stocking programs.					
Sage Creek	62 miles	Yellowstone cutthroat trout (N)	Wild	Conservation	Establish a fishable population under standard Central District fishing regulations following brook trout removal in 2010-2011.
Continue next page					

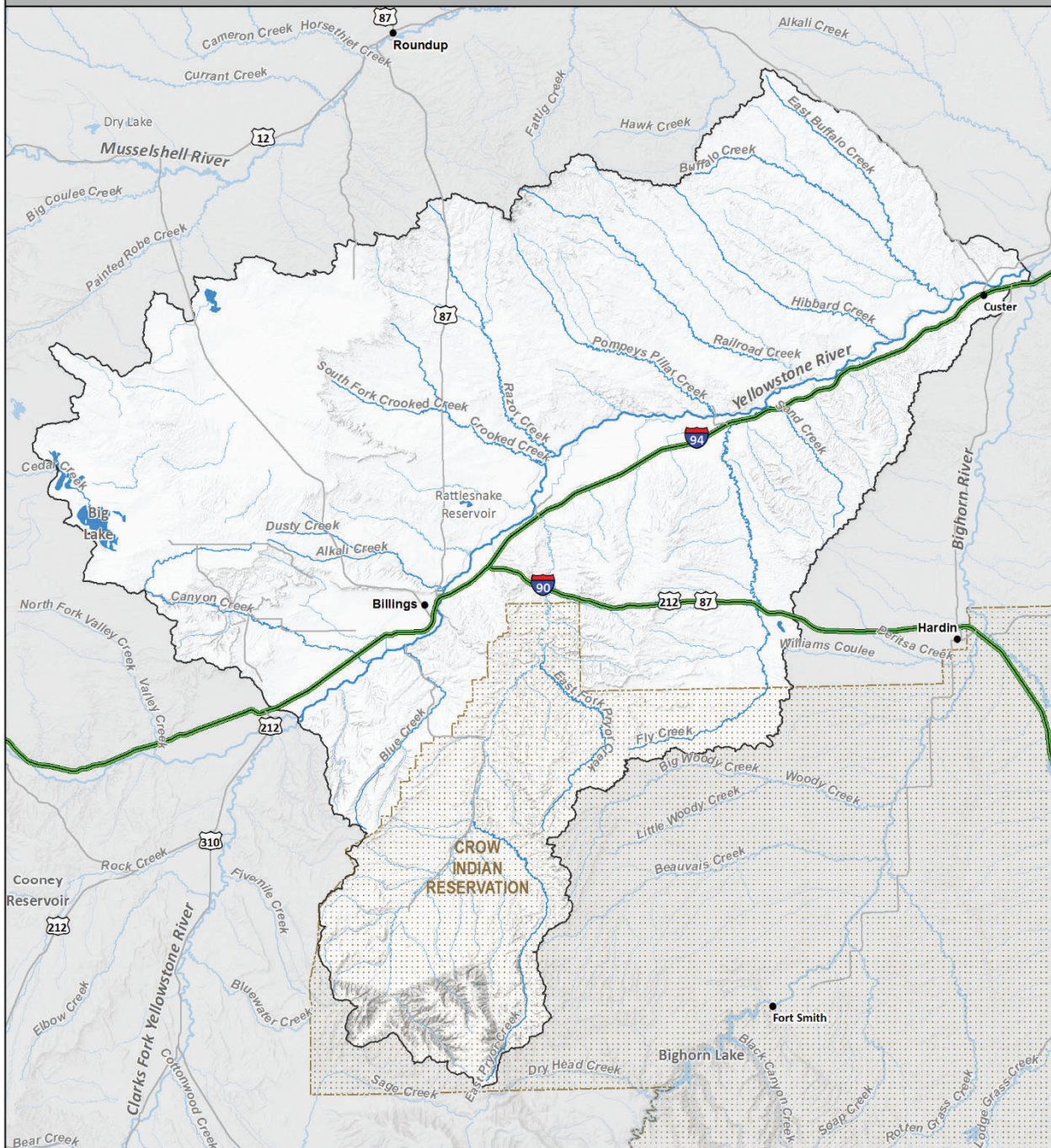
Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Longnose dace, Lake chub, Fathead minnow,	Wild	Conservation	Ensure these species re-establish following brook trout removal in 2010-2011. Remove brook trout as necessary. Believed to be eradicated after 2016 NF Sage treatment supported by 2017 eDNA analysis and field survey.
		Prairie fish assemblage (N)	Wild	General	Maintain populations. If necessary, evaluate feasibility of this becoming a source of certified live bait for Bighorn Lake anglers.
Habitat needs and activities: Currently in the process of removing non-native trout and re-establishing Yellowstone cutthroat trout. Water goes sub-surface frequently once the creek reaches Bowler Flats, several in-channel dams provide refuge for minnow and sucker species, consider efforts to improve habitat. Sage Creek may need some habitat improvement for spawning areas as well as riparian fencing to reduce grazing impacts on public and private lands.					
Bighorn Reservoir tributaries (Piney Creek, Dry Head Creek Crooked Creek)	33 miles	Yellowstone cutthroat trout (N)	Wild	Conservation	Aboriginal populations, no harvest allowed.
		Brown trout (Crooked Creek below barrier)	Wild	General/ Suppression	Consider reducing or eliminating this and other trout species in the reach from the barrier to the reservoir and replacing with Yellowstone cutthroat trout. Most of the reach is in Wyoming and would require a coordinated effort.
Habitat needs and activities: Riparian protection needed as many areas in the Pryor Mountains are overgrazed; many road projects could jeopardize trout populations with perched culverts and increased erosion from road work. Barrier placed in Crooked Creek 2008 may need occasional repair, Habitat improvements in Piney Creek need to be maintained.					
Afterbay Reservoir	176 acres	Rainbow trout	Hatchery/ Wild	Put, Grow and Take	Stock in years when full drawdown is not conducted. Drawdown is done every 3 years by BOR to evaluate seeps from dam. Evaluate stocking with considerations for influence on river populations.
Habitat needs and activities: this is a re-regulation reservoir with the potential for 15 vertical feet of elevation change daily, which is a limiting factor to do any substantial fishery management.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Bighorn River - Downstream of Yellowtail Reservoir	84 miles	Sauger (N)	Wild	Conservation	Maintain reduced harvest limits, better understand genetic composition. Investigate opportunities for sauger population improvement in the lower river.
		Channel Catfish (N)	Wild	General	Manage as a recreational fishery.
		Burbot (N)	Wild	General	Evaluate population to determine status.
		Mountain whitefish (N), Rainbow trout, Brown trout, Walleye, Smallmouth bass	Wild	General	Manage as a recreational fishery with focus of cold water species in the river above the Little Bighorn and cool and warm water species below the Little Bighorn.
		Native non-game species (N)	Wild	General	Improve documentation of abundance and distribution during standard and other sampling efforts.
Habitat needs and activities: Side channel restoration to maintain habitat diversity in the Bighorn to support a variety of fish sizes and species. Flow management activities will be required to ensure the fishery is provided adequate water to maintain the fishery. Work with BOR to meet flow targets and timing which support the rainbow and trout fishery in all water years. Gas super saturation in upper river is a recurring problem, look for ways to reduce the cause work with BOR and WAPA to reduce severity if possible. Increased bank stabilization work negatively influences riverine habitats, work with Conservation District and private landowners to find sustainable ways to protect the fishery and property.					
Arapooish Pond	27 acres	Largemouth bass	Hatchery	General/ Family Fishing water	Occasional re-stocking after winterkills.
		Carp, Native suckers (N), Bullheads, Minnows	Wild	General	Fish from the Bighorn River were able to access the pond during flooding in 2011. May need to address in the future if bass are impacted.
Habitat needs and activities: Lake is supported with aeration system to reduce frequency of winterkill, but with more depth the need for air pumps could be eliminated. Partial winterkill has occurred in years with a properly functioning aeration system.					



# Middle Yellowstone River Drainage

MONTANA FWP



- Tribal Lands
- Drainage Boundary



## Area of Interest



Map Produced by:  
ASP - Geographic Data Services  
ISR 43965 - Nov 23, 2018

Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

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Miles

## **MIDDLE YELLOWSTONE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

This reach of the Yellowstone River begins at the confluence of the Clarks Fork of the Yellowstone River and the Yellowstone River just upstream of Billings, the largest city in Montana. It flows west to east approximately 86 river miles to Ranchers Ditch Diversion Dam which is located about 2.5 miles downstream of the mouth of the Bighorn River. Most of this reach is located in Yellowstone County with the lower 2.5 miles in Treasure County. This entire section of river flows through a wide valley with high sandstone bluffs bordering and confining the river on one side or the other through most of the reach. The dominant bluffs are on the south side of the river upstream of Billings and then switch to the north side the rest of the way down. The channel in this section of the Yellowstone is dominated by a cobble and gravel substrate with many islands and gravel bars. Where it can, the river channel is constantly moving within its flood plain. The railroad right-of-way borders the south side of the Yellowstone River along most of this reach, and in many places the railroad line forms the south bank of the river so the riverbank is heavily armored with large rip rap. The very upper end of this reach is highly urbanized between the cities of Laurel, Billings and Lockwood. As a result, much of the river bank in this section is armored and controlled with rip rap and dikes. A high percentage of the rip rap in this section is concrete rather than rock. Downstream of Lockwood, the river flows past the small towns of Huntley, Shepherd, Pompeys Pillar and Custer.

The Clarks Fork of the Yellowstone enters the Yellowstone River at the upper end of this reach. Two larger tributaries, Canyon Creek from the north, and Pryor Creek from the south enter the Yellowstone in the Billings area. A number of smaller tributary streams enter the Yellowstone from both sides of the valley throughout this section. The only major drainage that feeds into the Yellowstone in this section is the Bighorn River that flows in from the south about 2.5 miles upstream of the lower end of this reach.

The Yellowstone valley is dominated by agriculture growing sugar beets, grains, hay and cattle. As a result, the valley is laced with a network of large irrigation projects that divert a significant volume of water out of the river. Some of these irrigation projects can entrain large numbers of fish. Many of these irrigation systems are designed to use natural tributary streams as waste channels to return excess water back to the Yellowstone River when irrigation demands are lower. This operation can seriously impact flow patterns in these natural streams, cause serious erosion along these stream channels and transport different fish species unnaturally throughout the valley.

Two major low-head diversion dams are present in this section of the Yellowstone with a third structure at the very lower end of the reach. Huntley Diversion Dam is located about 27.4 river miles downstream from the upper end of this reach or about 10 miles east of Billings. It is a concrete-capped weir with a structural height of 10.5 feet and a hydraulic height of 8 feet. This dam spans the entire main channel of the Yellowstone and during normal flow conditions, is an almost complete fish passage barrier for most species of fish found in this section of the river. A seasonal side channel that bypasses the dam to the north side may provide some fish passage especially during higher flows. This side channel merges with the main channel about 3,650 feet



downstream of the dam so fish moving upstream that are blocked by Huntley Dam are unlikely to drop far enough downstream to find this passage around the dam. A fish passage structure was added to Huntley Dam in 1999-2000 when the dam was rebuilt after damage from high water in 1997. This passage was designed to provide passage for warmwater fish species found in this section of the Yellowstone, but the structure was not built as designed, and follow-up studies found that very few fish used the bypass structure. In March of 2015, the channel was lengthened to reduce slope with anticipation this would improve fish passage. A graduate study is planned in 2019 and 2020 to evaluate the passage and make recommendations as necessary. This study will be used to inform passage requirements for other locations and will be funded by the NRD funds from the 2011 oil spill.

Waco Diversion Dam is located 62.4 river miles downstream from the upper end of this reach. It is another concrete-capped weir that spans the main river channel. It is not as high as Huntley Dam, but still causes a serious high velocity drop off the face of the dam during normal flow conditions, and is likely a fish barrier to most species in the area. Waco Dam has a more developed bypass channel around the dam to the north. This channel maintains better flows during lower water periods than the bypass around Huntley Dam and the downstream connection of the bypass channel to the main channel is closer to the dams so this channel may provide better fish passage than the Huntley bypass channel.

Ranchers Ditch Diversion is located at the downstream boundary of this reach. This diversion consists of two structures spanning both channels at the top of an island. The diversion in the smaller south channel consists of a concrete-capped rubble weir with a well-defined dam crest yielding a nearly vertical plunging flow. This structure presents major fish passage issues. The structure on the larger north channel consists of a concrete and rock cap placed over an old steel piling and brush bundle dam. Flow over this section of the diversion is more irregular with a less distinct drop and greater slope. Because flow over the north dam is more like a flow over a steep riffle this section of the dam is probably less of a fish passage barrier than the other diversions in this reach. The irrigation company is constantly working on the north dam, and recent plans to rebuild part of this diversion could increase fish passage issues.

## **FISHERIES MANAGEMENT**

The upper end of this reach on the Yellowstone River represents the transition zone from a coldwater, trout dominated stream to a warmwater stream. Trout numbers drop off rapidly in the upper 27 miles of this reach as cool and warmwater fish numbers increase. The free-flowing nature of the Yellowstone River, the natural hydrograph and fairly natural habitat conditions allows the Yellowstone to support and maintain a wide diversity of native and introduced fish species. This reach of the Yellowstone supports approximately 40 different fish species including 28 native species. As a result, this section of the Yellowstone is managed with an emphasis on maintaining the diverse native fishery of both game and nongame species.

The entire reach is managed to provide a diverse recreational fishery for both native and introduced fish with regulations designed to help protect native populations while promoting harvest on nonnative predatory species that can impact native populations. The entire Yellowstone River is managed as a wild fishery with no routine stocking occurring on any section of the river. The upper end of this reach still supports a fairly good rainbow, brown trout and mountain whitefish fishery. As the river transitions into a warmwater fishery below Huntley

Dam emphasis shifts to native channel catfish, sauger, and burbot and nonnative smallmouth bass and walleye. Other game species that occasionally show up in this fishery include northern pike, largemouth bass and crappie. Some nongame species such as goldeye also provide popular angling opportunities.

Restrictive regulations only allowing a harvest of one sauger per day, with a possession limit of two sauger, is designed to protect the limited and genetically unique sauger population in this reach. Cartersville Dam near Forsyth, about 59 miles downstream of this reach has been shown to be a significant barrier to upstream fish movement with a noticeable reduction in sauger numbers and almost total elimination of some species like shovelnose sturgeon upstream of the dam. Channel catfish limits have been reduced statewide to provide additional protection to this long-lived native game fish. All other game species in this reach are managed under standard Central and Eastern district limits. Angling is open year-round on this section of the Yellowstone River although river ice can severely limit the winter fishery most years. Historically, bank fishermen have been the main anglers on this section of the Yellowstone River; but in recent years more and more anglers are using jet boats and kayaks, which has significantly increased angler use during the spring, summer and fall seasons.

Another important management concern in this section of the Yellowstone River is protection and enhancement of populations of smaller native fishes including numerous minnow and sucker species. These smaller fish provide the main forage base necessary to maintain the populations of larger game fish in the river and associated tributaries. In addition, these nongame species are an important part of the diverse native fish fauna that fulfill an ecological role important to the native species management aspect of the middle Yellowstone River. Complaints that the minnow populations are being removed from open water in the winter have increased and reported to be due to commercial seining and trapping.

The majority of tributary streams that feed this reach of the Yellowstone River are smaller prairie streams that provide limited or no recreational angling opportunities. Many of these streams are important to the different life history stages of the various native fish populations in this reach. The Bighorn River is the only major tributary that flows into this reach of the Yellowstone. It enters the Yellowstone approximately 2.5 miles upstream from the lower end of this reach. The Bighorn River is managed as a recreational tailwater trout fishery in the upper end below Yellowtail Dam and transitions into a warmwater fishery before it enters the Yellowstone River.

Several smaller lakes, ponds, and reservoirs including Lake Elmo, Lake Josephine, Laurel Pond, Broadview Pond, Joel's Pond, and Anita Reservoir, and private ponds with agreements to allow some public access, provide important urban fisheries in the Billings area. These waters are stocked annually with trout as put-and-take fisheries or with largemouth bass, as needed, as put-grow-and-take fisheries. Being close to the largest population center in the state, these waters receive considerable angler use. Good creel data is lacking and needed for these waters. Water levels in some of these lakes are impacted by irrigation demands so it is important to maintain a good working relationship with the associated irrigation districts.

## **HABITAT**

The upper end of this reach represents a transition zone from a relatively clear, coldwater stream to a more turbid warmwater stream. The Clarks Fork drainage at the top of the reach adds

considerable sediment to the Yellowstone from early spring runoff until late fall. As the river flows through the city of Billings, heated water from industrial discharges warms up the water temperatures enough that a section of river downstream of town remains ice free throughout the winter except during the most extreme conditions. All of the tributaries that enter this section of the Yellowstone add turbidity to the river and this turbidity increases during the irrigation season when the different tributaries are flushed with excess water out of the various irrigation ditches. Water temperatures in the upper reach above Billings can reach the mid-70° F range during low water years, while temperatures in the lower end of the reach above the Bighorn River can get into the mid- to high 80s. Flows at the USGS gage at Billings have ranged from a low of 15,200 cfs on May 10, 1934 to a high of 82,000 cfs on June 12, 1997.

This section of the Yellowstone can be affected by the FWP Drought Fishing Closure Policy that requires priority waters be closed to angling if flow or temperature thresholds are reached. Because this section of river represents the transition from cold to warm water habitat on the Yellowstone, past drought closures have normally only extended downstream to the upper end of the warmwater section at Huntley Dam.

The channel in this reach of the Yellowstone is dominated by boulder and cobble substrate with sediment and sand deposits in slower sections. Where the river isn't controlled by natural bluffs, railroad rip rap, or other man caused bank armoring, it moves fairly naturally within its normal flood plain. River channels are constantly moving and shifting by eroding and laying down new gravel and point bars. Except in the highly urbanized upper section, the riparian zone along this section of the Yellowstone is in fair condition with good cottonwood and willow bottoms. Some agricultural activities extend right to the river's edge, and both Russian olive and salt cedar (noxious weeds) invasions present serious threats to the riparian zone along this entire reach. The section through Billings has a high density of riprap and influences from industry which at times alters temperature and water chemistry.

Huntley Dam and Waco Dam within the reach, and Ranchers Ditch Diversion at the lower end of the reach, all present fish passage and boat passage issues. These diversions, along with a number of other pump and gravity feed irrigation systems can seriously impact instream flows along this section of the river, and all of them can cause fish loss due to entrainment. FWP has reserved water rights for instream flow with a 1978 priority date on the Yellowstone River. At Billings these reserved rights range from winter flows of 2,483 cfs in January to spring runoff flows of 18,716 cfs in late June. Reserved rights at Billings for the summer and fall irrigation season range between about 3,100 and 4,000 cfs. During low water years, river flows drop below these reservation rights and FWP places calls on water users with rights junior to the FWP 1978 priority date.

Pryor Creek was dammed by an irrigation ditch flume which was blown out in 2011. In place of rebuilding the flume which created the dam a siphon was built instead. This created open passage of fish. A Rocky College study funded by FWP showed rapid use of this stream by most prairie fish in addition to channel catfish and smallmouth bass. Efforts were put out to improve passage at the Siewert Diversion but cost/benefit restraints have precluded this project from being implemented.



## **FISHING ACCESS**

FWP manages seven FASs along this reach of the Yellowstone River and another site one mile up the Bighorn River that provides boat access to the lower end of this reach. Five of these sites are day use only, while three of them offer overnight camping. A large wildlife management area and associated BLM land located on the north side of the river near the town of Pompeys Pillar provide walk-in access to over five miles of river frontage. Several other publicly owned or managed access points along this section of the Yellowstone provide river access and access for carry-in type boats. Only one of these sites, a county park near Billings, has an actual boat ramp.

Reliable motor boat access is an ongoing concern in this section of the Yellowstone River due to the natural, free flowing nature of the river. Jet boaters and floaters are an important and growing user group on this section of river. The constant movement of the river within its flood plain, and the continuing movement and shifting of gravel bars along the river, which help make the river such a unique and important fishery resource, also make it very difficult to maintain permanent motor boat access along the river. Motor boat use, especially during lower flows, is currently difficult or impossible at several of the existing access sites along this reach, and access changes after each high-water event. The highest priorities for new access along this reach would be just up- and downstream of Huntley Dam and in Billings. In the past it has been possible to boat around Waco Dam through the north bypass channel during most flow conditions. Recent changes in this bypass channel could eliminate boat passage except during high water. Without reliable jet boat passage, additional access above and below Waco Dam would become a high priority. Any potential new access in a relatively stable section of river that can provide reliable ramp access to the river should be considered a high priority.

FWP is currently working with the Yellowstone River Parks Association and the Department of Justice NRD program to develop another FAS site at South Billings Boulevard near the bridge. This will be a day use site with a concrete boat ramp. Current plans are to have this site open in 2019. FWP was awarded \$400,000 of NRD funds as mitigation for the recreational loss due the 2011 Exxon oil spill. These funds will be used with partners to improve existing FAS sites and to develop new access sites in the upper portion of this management area on the Yellowstone River.

There is potential for several additional urban and exurban areas to produce or gain access to ponds that may be open for public fisheries and recreation. FWP will continue to work with partners on known and potential new projects.

## **SPECIAL MANAGEMENT ISSUES**

There are several special management issues associated with this section of the Yellowstone River with the most prominent issue being that of native species management. Recent genetic research has shown that the sauger population in this section of the river is genetically unique from any other sauger populations in the remainder of the Yellowstone, Bighorn, or Missouri river drainages in Montana or Wyoming. Additional work is needed to learn more about this sauger population and identify steps necessary to maintain its unique characteristics.

Smallmouth bass numbers have greatly increased in this section of the river in recent years. Although they provide a very popular fishery, the impacts this new predator base is having on

the native fish populations in the river is poorly understood and needs additional study. Smallmouth bass also expanded into Pryor Creek and upstream reportedly as far as Livingston. An evaluation of bass is ongoing with USGS. Smallmouth bass bag limits were increased to allow anglers to capitalize this abundant fishery; it is not believed angling will increase total annual mortality but will still be within typical natural mortality rates. Walleye numbers also appear to be increasing in this reach, and their impacts, both as an added predator and their potential hybridization with sauger could impact native fish populations.

The impacts of commercial bait seining on native minnow populations along this section of the Yellowstone River is another major concern. The Yellowstone drainage has become the main source of minnows for a majority of the commercial bait operations throughout eastern Montana. Seiners come from all over eastern Montana to seine the river and tributaries along this reach of the Yellowstone, and this pressure could continue to increase as areas in northeast Montana are closed to seining due to the presence of Eurasian watermilfoil. This seining pressure, especially when combined with increased predation from smallmouth bass and walleye, could have serious impacts on native minnow and sucker populations. Reduction in numbers of these species could seriously impact the native game species that rely on them as forage.

### FISHERIES MANAGEMENT DIRECTION FOR MIDDLE YELLOWSTONE RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River (Confluence of Clarks Fork of the Yellowstone River to Ranchers Ditch Diversion)	86.1 miles	Rainbow trout, Brown trout, Mountain whitefish (N)	Wild	General	Manage as a recreational fishery allowing for limited harvest with standard regulations.
		Sauger (N)	Wild	Conservation	Manage sauger populations for limited consumptive harvest with harvest restrictions upstream of Cartersville Dam. Conduct studies to evaluate the importance of the unique genetic character of the sauger population in this section of the Yellowstone. Identify spawning areas and migratory patterns that have helped maintain this genetic uniqueness. Determine value and importance of improving or restricting fish passage in the lower Yellowstone to maintaining this genetically unique population.
		Burbot (N)	Wild	General	Attempt to enhance this burbot population and manage for limited harvest. Identify factors limiting the burbot population in this section of the Yellowstone.
		Channel catfish (N)	Wild	General	Manage as a recreational fishery with emphasis on maintaining a diverse population structure, while providing opportunities to catch larger catfish. Standardize catfish sampling as much as possible in Eastern Montana. Evaluate impacts of recent regulation changes on catfish populations.

Continue next page

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Smallmouth bass	Wild	General	Manage as a recreational fishery with emphasis on harvest. Conduct a study to evaluate the impacts of smallmouth bass on native fish populations in the Yellowstone River.
		Walleye	Wild	General	Manage as a recreational fishery with emphasis on harvest.
		Native nongame species(N)	Wild	Conservation	Manage commercial minnow harvest to protect native fish populations. Conduct studies to evaluate and determine habitat and flow needs for native fishes. Work with other permitting agencies to limit impacts of habitat change along the Yellowstone River.
Habitat needs and activities: Improve fish passage for warmwater species at all diversion dams from Intake Dam upstream. Reduce entrainment and loss at head gates and pumps. Maintain or improve instream flows in the river and tributaries. Manage habitat projects to maintain the natural stream functions of a wild undammed river, and evaluate habitat projects based on cumulative impacts.					
Pryor Creek (Downstream of Crow Reservation Boundary)	16.1 miles	Multiple species	Wild	General	Evaluate and improve fish passage issues upstream of the Yellowstone River. Monitor fish movement in and out of the Yellowstone River, monitor spawning success of game and nongame species, and monitor the establishment of resident fish populations in Pryor Creek. Manage Pryor Creek to provide a continuing source of young game fish and forage to the Yellowstone River.
Habitat needs and activities: Improve upstream fish passage now that Pryor Creek has been reconnected with the Yellowstone River. Improve summer stream flows and improve habitat to support ecosystem function and production of native species.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone Tributaries (Smaller Prairies Stream)	42 streams and 290 miles	Multiple native species (N)	Wild	Conservation	Manage commercial minnow harvest to protect native fish populations.
Habitat needs and activities: Evaluate barriers in each tributary and improve fish passage and connectivity with the Yellowstone River. Improve habitat to support ecosystem function and production of native species.					
Lake Elmo	65 acres	Rainbow trout, brown trout Yellowstone cutthroat trout (N), Largemouth and Smallmouth Bass)	Hatchery	Put and Take/ Family Fishing water	Manage for maximum recreational use with emphasis on harvest. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid’s fishing events.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 3 to 4 year rotation as needed and available to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy sized fish.
		Channel catfish(N)	Hatchery	Put, Grow and Take	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.
		Yellow Perch, Crappie, Pumpkinseed	Wild	General	Should consider wild fish transfers when fish are available.
Habitat needs and activities: Work with Billings Heights Water and Lake Elmo State Park on water management for the lake. Limit water level fluctuation during the weekends and ensure the lake is full before the ditch is shut off in the fall. Develop long-term lake management plan to improve fisheries habitat in the lake.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Lake Josephine	20 acres	Largemouth and smallmouth bass	Hatchery/ Wild	General/ Family Fishing water	Stock every other year to supplement natural reproduction. Promote voluntary catch-and-release on 12 to 15 inch bass. May use smallmouth bass for stocking at irregular intervals.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 3-4 year rotation as needed to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy sized fish.
		Channel catfish (N)	Hatchery	General	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.
		Yellow Perch, Crappie, Bluegill, Pumpkinseed	Wild	General	Wild transfers should be considered in the future. Particularly if habitat improvements are made.
Habitat needs and Activities for Lake Josephine (Riverfront): Potential exists to improve average depth with excavation or building bars, installation of fishing piers, and other access and habitat improvements. Work with City of Billings, NRD, and others to make improvements when possible.					
Laurel Pond	18 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put and Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid’s fishing events.
Habitat needs and activities: Maintain windmills for aeration. Would benefit pond to increase average depth. Opportunity to dredge/dig or create bars with existing bottom material may come from partnership with Lions Club, and other interested groups. Ponds has substantial goldfish population.					



Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Anita Reservoir	30 acres	Largemouth bass	Hatchery	General/Family Fishing water	Stock as necessary to maintain a recreational fishery.
Habitat needs and activities: Should coordinate with the Huntley Irrigation District to improve long-term water management to benefit the fishery. They are not overly interested at this time.					
Broadview Pond	20 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put and Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to provide occasional larger trout.
Habitat needs and activities: consider windmills for aeration.					
Joel's Pond	14 acres	Largemouth bass	Hatchery	General/ Family Fishing water	Stock as necessary to maintain a recreational fishery
		Green sunfish, Pumpkinseed, Common Carp, Fathead Minnow	Wild	General	Species found during first survey. Manage as forage for bass with recreational sunfish opportunity for family fishing.
Habitat needs and activities: Coordinate with the YRPA to manage fishery and public access.					
Shiloh Ponds 1 and 2	10 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put and Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to provide occasional larger trout.

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Deep Mill (Audubon Pond)	2.4 acres	Largemouth bass	Hatchery	General/Family Fishing water	Stock as necessary to maintain a recreational fishery.
		Green sunfish, Pumpkinseed Black bullhead	Wild	General	Species found during first survey. Manage as forage for bass with recreational sunfish opportunity for family fishing.
Habitat needs and activities: Coordinate with the YRPA and Audubon Society to manage fishery and public access. Install solar aeration system in 2018.					
Other private and public ponds	Various	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put and Take	Several other opportunities in private ponds with public access. Work with landowners to maintain fisheries and access. New opportunities may arise.
		Other species as determined	Hatchery/ wild transfer		